Digital Image Processing

Homework Assignment #1

Due: 9:20am, 10/14, 2022

Four Requirements

1. Write a program for non-integer scaling of an image with two interpolation methods:

    -- Bilinear interpolation

    -- Bicubic interpolation

2. Take a selfie of yourself, and apply the above image scaling program on your selfie (or part of your selfie, e.g., your right eye) with the scaling factors of 0.2, 5, and 32.

3. Compare the quality of the images obtained with bilinear interpolation and with bicubic interpolation.

4. Explain the method of bicubic interpolation, and compare its computational complexity with that of bilinear interpolation.

Language for Implementation

- C++ or Python (If you want to use other languages, please contact TAs. We need to make sure we can run your program!)
- OpenCV is a useful open library for image processing, and you can use the function in OpenCV directly.

Report

- For requirements 1 & 2, you need to show
  - which function you use or implement
  - how does your program work
  - how to use your program
- For requirements 3 & 4, you need to provide
  - Resulted images for comparison
  - Explanation

Submission

- Please submit a .zip/.rar file to NTU COOL, containing
  - Project (source code and execution file)
  - Report (.pdf file)
- Late submission:
  - within 24 hours after its due will incur 20% penalty,
  - after 24 hours and within seven days of its due will incur 50% penalty, and
  - after seven days of its due will not be graded.

  Note: One minute late is the same as 23 hours late.

DO NOT COPY OTHER'S HOMEWORK!!